

SOURCE:  
Landcover from CCC HCP, ESA-PWA 2012

Knightsen Feasibility Assessment .120943  
**Figure 1**  
Existing Landcover-Knightson

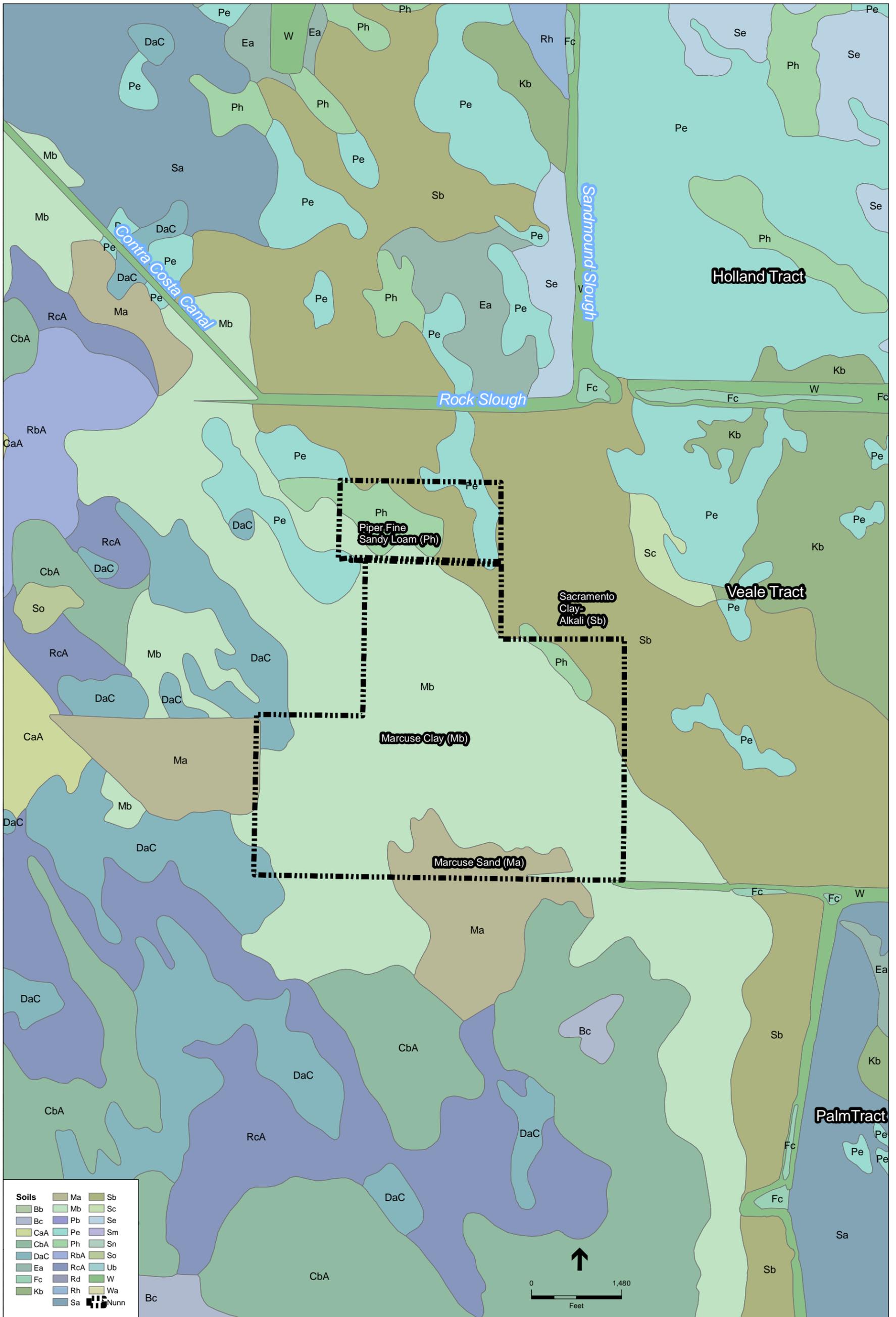


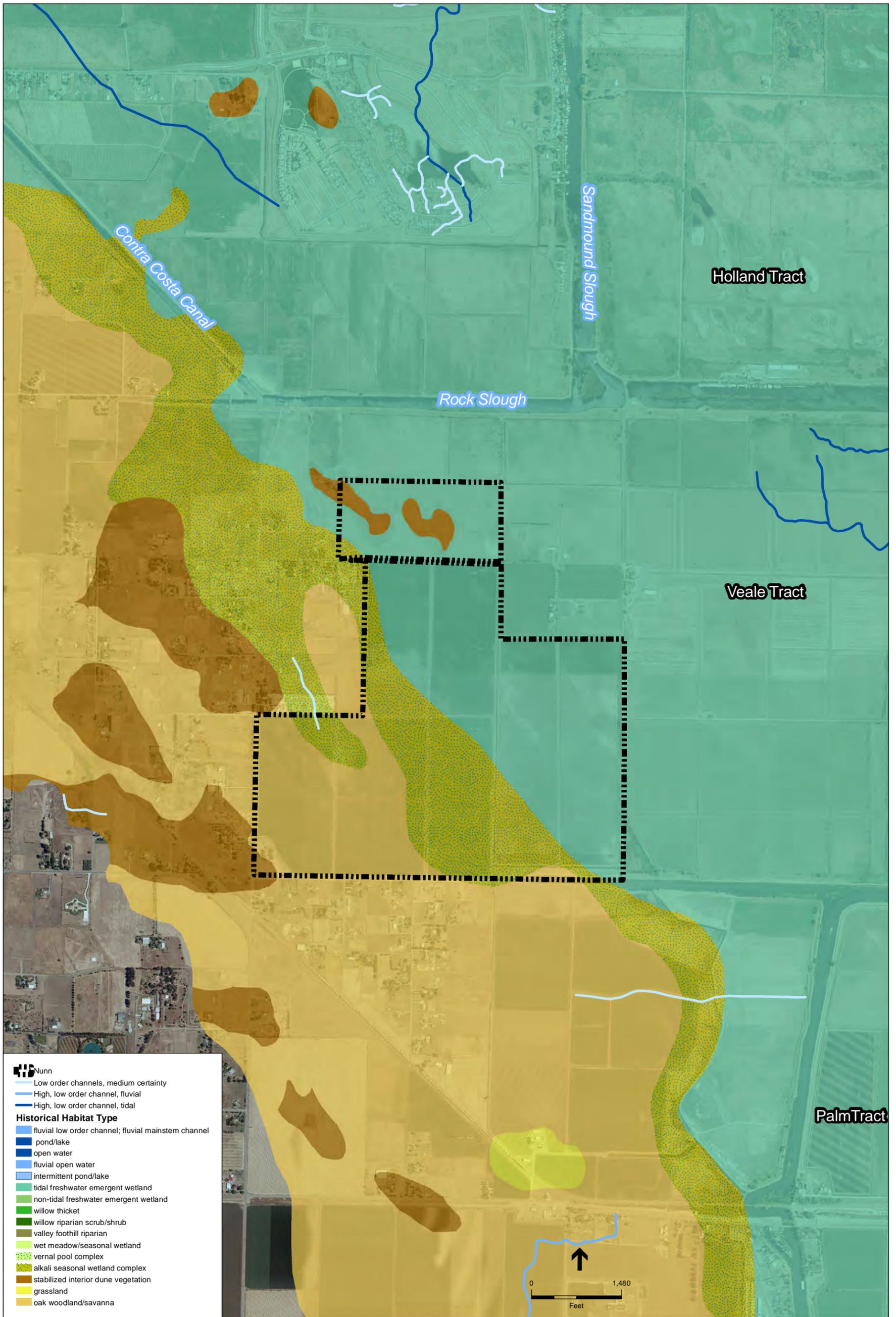


SOURCE: NAIP 2012 (Imagery) ESA-PWA 2012

Knightsen Feasibility Assessment .120943  
**Figure 2**  
 Knightsen 645 Site Boundary







SOURCE:

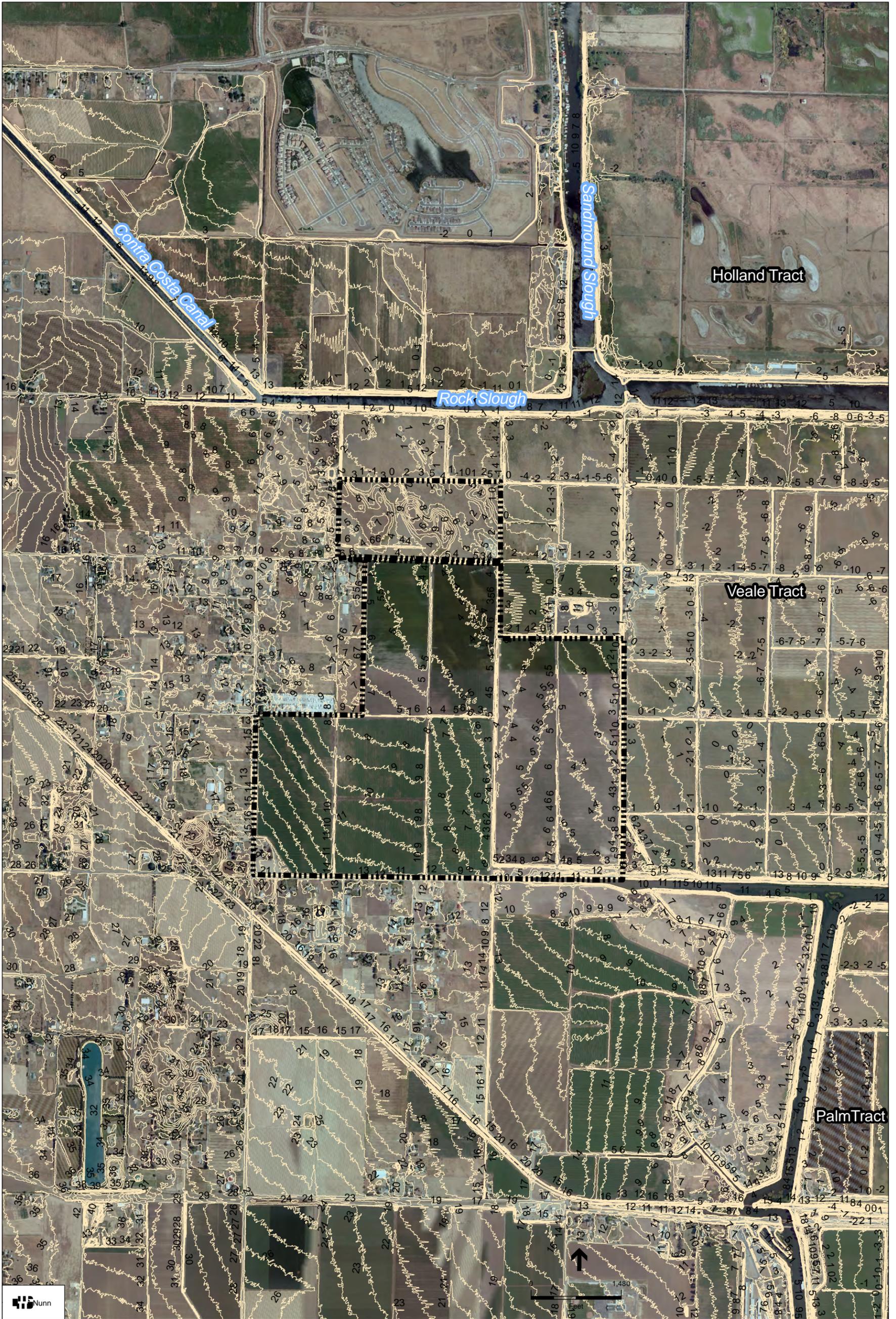
Historical Habitats Whipple et. al 2012, ESA-PWA 2012

Knightsen Feasibility Assessment .120943

**Figure 4**

Historical Habitats-Knightson



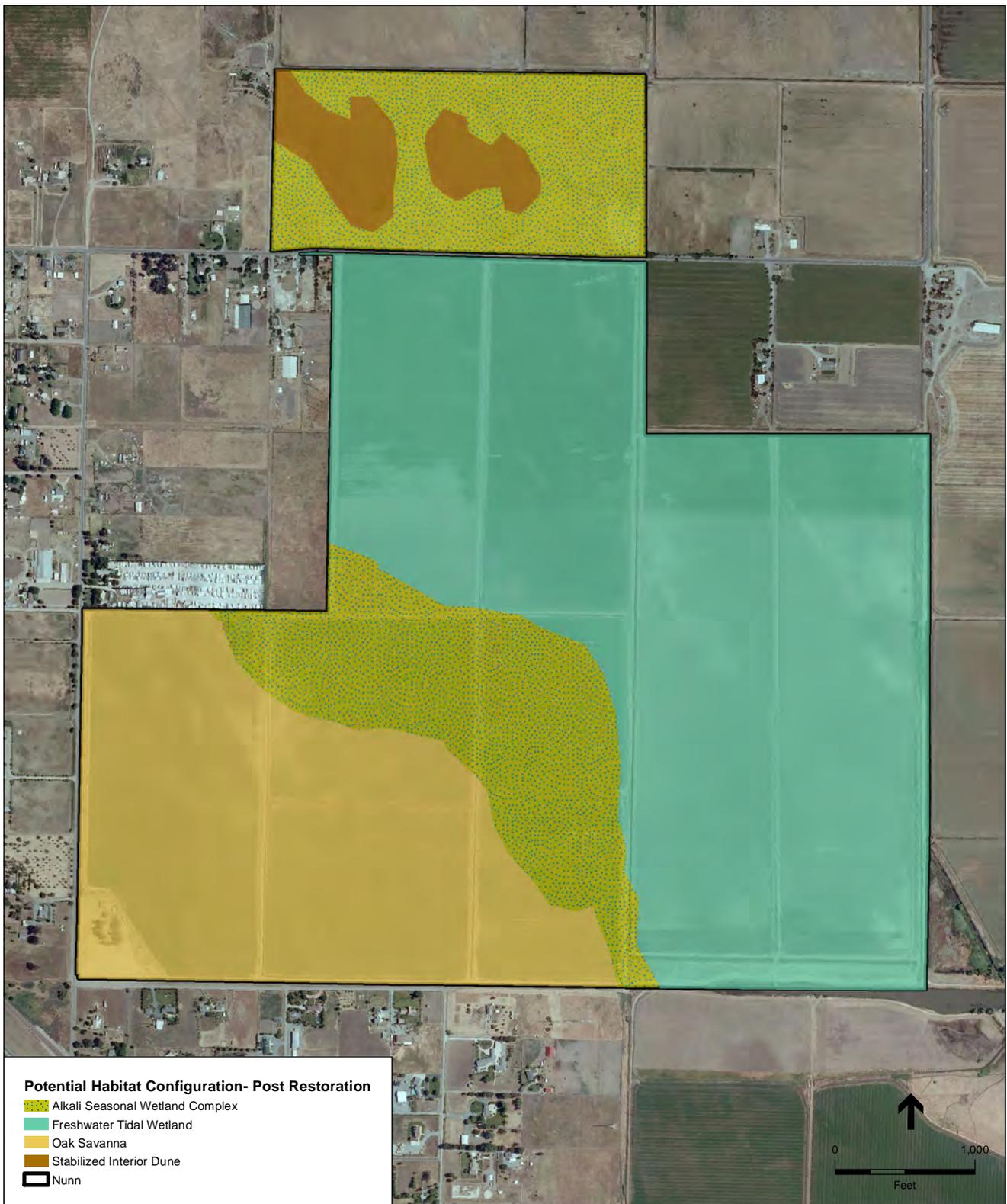




SOURCE:  
Aerial from NAIP 2009

Knightsen Feasibility Assessment .120943  
**Figure 6**  
 Potential Storm Water Biofiltration Swales





SOURCE:  
Aerial from NAIP 2009

Knightsen Feasibility Assessment .120943

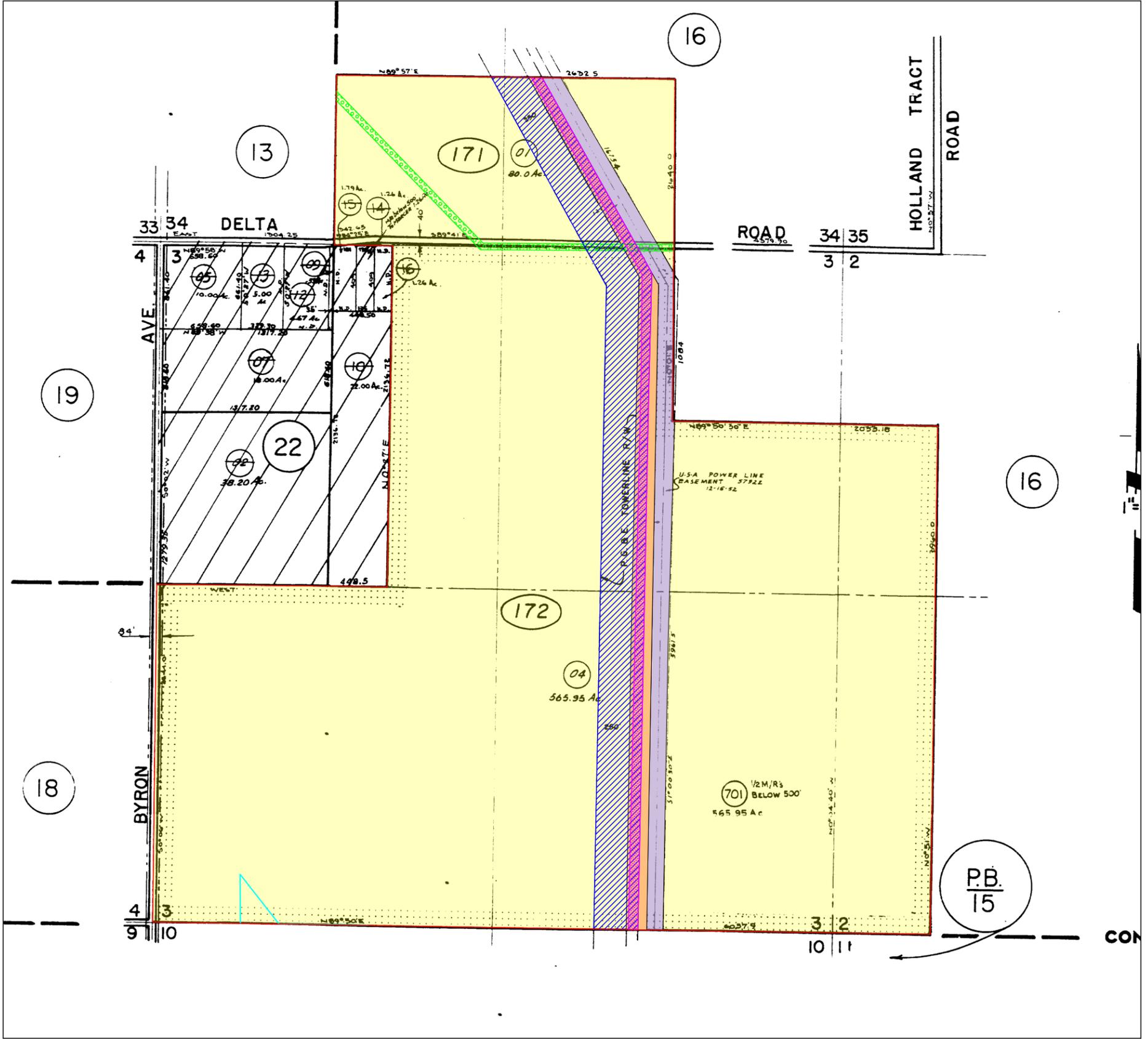
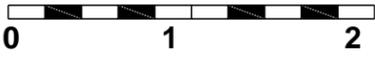
**Figure 7**

Potential Habitat Configuration- Post Restoration



Appendix A:  
Power line Easements

Standard Scale 1 : 1



**LEGEND**

- Parcel (Fee, Property in Question)
- Item No. 13 - Easement for Polelines and wires  
09/03/1931, Book 293 Page 24, of Official Records  
Said Easement is not specifically delineated and is un-locatable
- Item No. 14 - Easement for ditches  
12/14/1945, Book 828, Page 55, of Official Records  
Said Easement is not specifically delineated and is un-locatable
- Item No. 16 - Easement for Transmission lines  
11/06/1950, Instrument No. 57182, Book 1663, Page 564, of Official Records  
Affects as described therein
- Item No. 17 - Easement for Transmission lines  
11/15/1950, Book 1668, Page 494, of Official Records  
Affects as described therein
- Item No. 19 - Easement for Power lines  
12/09/1952, Book 2041, Page 111, of Official Records  
Affects as described therein
- Item No. 20 - Easement for Irrigation ditches  
04/26/1960, Book 3606, Page 88, of Official Records  
Affects as described therein
- Item No. 22 - Easement for Pole lines  
11/27/1964, Book 4751, Page 636, of Official Records  
Affects as described therein
- Item No. 23 - Easement for Poles, anchor, wires  
03/22/1983, Book 11173, Page 808, of Official Records  
Said Easement is not specifically delineated and is un-locatable
- Item No. 25 - Easement for temporary working areas  
02/06/1995, Instrument No. 95-27362, of Official Records  
Affects as described therein

**Old Republic Title Company**  
 555 12 th Street, Suite 2000  
 Oakland, CA 94607  
 (510) 272-1121 FAX(510) 208-5045

*"Notice: This is neither a plat nor a survey. It is furnished merely as a convenience to aid you in locating the land indicated hereon with reference to streets and other land. No liability is assumed by reason of any reliance hereon."*

NOTE: Easements depicted hereon are provided as a courtesy only and no representation is made as to the accuracy or completeness thereof. The Company assumes no liability for any loss occurring by reason of reliance thereon. It is recommended that a survey be obtained from a licensed professional to determine actual locations.

|  |  |                       |
|--|--|-----------------------|
| Title Order No. 1117012113, Preliminary Report Dated as of July 25, 2012                       | Drawing Date: 12/06/2012                     |                       |
| Reference :  | Data :                                       |                       |
| Property: 8831 Byron Highway, Byron, CA 94513  | Assessor's Parcel Nos. : 020-171-001 and 004 |                       |
| Plat Showing the Portion of Real Property, in the County of Contra Costa, State of California. |  |                       |
|  |  | Sheet<br>1<br>of<br>1 |
|  |  | Archive #             |

Appendix B:  
Soil Sample Results

# A & L WESTERN AGRICULTURAL LABORATORIES

1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736



REPORT NUMBER: 12-361-002

CLIENT NO: 9999-D

SUBMITTED BY: JESSICA OLSON

SEND TO: ESA PWA  
2600 CAPITOL AVE, STE 200  
SACRAMENTO, CA 95816-

GROWER:

DATE OF REPORT: 12/28/12

## SOIL ANALYSIS REPORT

PAGE: 1

| SAMPLE ID | LAB NUMBER | Organic Matter |           | Phosphorus         |                       | Potassium | Magnesium | Calcium | Sodium | pH      |              | Hydrogen   | Cation Exchange Capacity | PERCENT CATION SATURATION (COMPUTED) |      |      |      |     |
|-----------|------------|----------------|-----------|--------------------|-----------------------|-----------|-----------|---------|--------|---------|--------------|------------|--------------------------|--------------------------------------|------|------|------|-----|
|           |            | *              | **        | P1                 | NaHCO <sub>3</sub> -P | K         | Mg        | Ca      | Na     | Soil pH | Buffer Index | H meq/100g |                          | C.E.C. meq/100g                      | K %  | Mg % | Ca % | H % |
|           |            | % Rating       | ENR lbs/A | (Weak Bray) **** * | (Olsen Method) **** * | **** *    | **** *    | **** *  | **** * |         |              |            |                          |                                      |      |      |      |     |
| KNG06     | 52044      | 3.3M           | 96        | 50VH               | 44VH                  | 369M      | 1475VH    | 2765L   | 552H   | 7.3     |              | 0.0        | 29.3                     | 3.2                                  | 41.4 | 47.1 | 0.0  | 8.2 |
| KNG05     | 52045      | 3.3M           | 96        | 38H                | 28VH                  | 287M      | 881VH     | 2304L   | 215M   | 7.4     |              | 0.0        | 20.4                     | 3.6                                  | 35.5 | 56.3 | 0.0  | 4.6 |

| SAMPLE NUMBER | Nitrogen NO <sub>3</sub> -N ppm | Sulfur SO <sub>4</sub> -S ppm | Zinc Zn ppm | Manganese Mn ppm | Iron Fe ppm | Copper Cu ppm | Boron B ppm | Excess Lime Rating | Soluble Salts mmhos/cm | Chloride Cl ppm | PARTICLE SIZE ANALYSIS |        |        |              |  |
|---------------|---------------------------------|-------------------------------|-------------|------------------|-------------|---------------|-------------|--------------------|------------------------|-----------------|------------------------|--------|--------|--------------|--|
|               |                                 |                               |             |                  |             |               |             |                    |                        |                 | SAND %                 | SILT % | CLAY % | SOIL TEXTURE |  |
| KNG06         |                                 | 148VH                         |             |                  |             |               |             | L                  | 2.1H                   |                 |                        |        |        |              |  |
| KNG05         |                                 | 29H                           |             |                  |             |               |             | L                  | 1.6M                   |                 |                        |        |        |              |  |

\* CODE TO RATING: VERY LOW (VL), LOW (L), MEDIUM (M), HIGH (H), AND VERY HIGH (VH).  
 \*\* ENR - ESTIMATED NITROGEN RELEASE  
 \*\*\* MULTIPLY THE RESULTS IN ppm BY 2 TO CONVERT TO LBS. PER ACRE OF THE ELEMENTAL FORM  
 \*\*\*\* MULTIPLY THE RESULTS IN ppm BY 4.6 TO CONVERT TO LBS. PER ACRE P<sub>2</sub>O<sub>5</sub>  
 \*\*\*\*\* MULTIPLY THE RESULTS IN ppm BY 2.4 TO CONVERT TO LBS. PER ACRE K<sub>2</sub>O  
 MOST SOILS WEIGH TWO (2) MILLION POUNDS (DRY WEIGHT) FOR AN ACRE OF SOIL 6-2/3 INCHES DEEP

This report applies only to the sample(s) tested. Samples are retained a maximum of thirty days after testing.

*MB*  
 Mike Buttress, CPAg  
**A & L WESTERN LABORATORIES, INC.**

# A & L WESTERN AGRICULTURAL LABORATORIES

1311 WOODLAND AVE #1 • MODESTO, CALIFORNIA 95351 • (209) 529-4080 • FAX (209) 529-4736



REPORT NUMBER: 12-361-002

CLIENT: 99999

SUBMITTED BY: JESSICA OLSON

SEND TO: ESA PWA  
2600 CAPITOL AVE, STE 200  
SACRAMENTO, CA 95816-

GROWER:

DATE OF REPORT: 12/28/12

## SOIL SALINITY ANALYSIS REPORT

PAGE: 1

| Sample ID | Lab Number | SAR | ESP | Na meq/L | Ca meq/L | Mg meq/L | pH  | CO <sub>3</sub> meq/L | HCO <sub>3</sub> meq/L | E.C. dS/m | Cl meq/L | B ppm | Saturation % |
|-----------|------------|-----|-----|----------|----------|----------|-----|-----------------------|------------------------|-----------|----------|-------|--------------|
| KNG06     | 52044      | 4.9 | 5.6 | 13.5     | 8.1      | 7.1      | 0.0 | 0.0                   | 0.0                    | 0.0       | 0.0      | 0.0   | *****        |
| KNG05     | 52045      | 3.8 | 4.2 | 9.1      | 6.3      | 4.9      | 0.0 | 0.0                   | 0.0                    | 0.0       | 0.0      | 0.0   | *****        |

### NOTES:

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*Mike Buttress*  
Mike Buttress, CPAg  
A & L WESTERN LABORATORIES, INC.

# SOIL ANALYSIS

## General Guidelines for Interpreting Soil Analysis Ratings

**Comments:** Note that the cations potassium, magnesium, calcium and sodium are rated according to what percentage of the total cation exchange capacity they take. A clay soil may have 4,000 ppm calcium whereas a sandy soil may have only 400 ppm and both may be rated as “medium” in terms of their percent cation saturation.

These ratings are not crop-specific. However, when soil fertility guidelines are requested, specific crop requirements and tolerances are taken into account.

| Analyte                  | Description                    | Units         | VLow | Low   | Medium | High  | VHigh |
|--------------------------|--------------------------------|---------------|------|-------|--------|-------|-------|
| <b>OM</b>                | Organic Matter                 | percent       | 0.3  | 2.2   | 3.7    | 5.2   | 15.0  |
| <b>pH</b>                | Soil pH                        | pH            | 5.0  | 6.0   | 7.5    | 8.5   | 10.0  |
| <b>P1</b>                | Weak Bray-phosphorus           | ppm           | 8.0  | 17.0  | 26.0   | 39.0  | 90.0  |
| <b>HCO<sub>3</sub>-P</b> | NaHCO <sub>3</sub> -phosphorus | ppm           | 3.0  | 7.0   | 13.0   | 22.0  | 50.0  |
| <b>K</b>                 | Potassium                      | % Cation Sat. | 0.6  | 2.0   | 5.0    | 10.0  | 15.0  |
| <b>Mg</b>                | Magnesium                      | % Cation Sat. | 5.0  | 10.0  | 20.0   | 25.0  | 35.0  |
| <b>Ca</b>                | Calcium                        | % Cation Sat. | 35.0 | 60.0  | 70.0   | 75.0  | 85.0  |
| <b>Na</b>                | Sodium                         | % Cation Sat. | 1.0  | 3.0   | 5.0    | 10.0  | 30.0  |
| <b>NO<sub>3</sub>-N</b>  | Nitrate-Nitrogen               | ppm           | 4.0  | 12.0  | 25.0   | 40.0  | 65.0  |
| <b>S</b>                 | Sulfate-Sulfur                 | ppm           | 3.0  | 10.0  | 25.0   | 35.0  | 60.0  |
| <b>Zn</b>                | Zinc                           | ppm           | 0.5  | 1.0   | 3.0    | 6.0   | 9.0   |
| <b>Mn</b>                | Manganese                      | ppm           | 1.0  | 2.0   | 12.0   | 30.0  | 40.0  |
| <b>Fe</b>                | Iron                           | ppm           | 5.0  | 10.0  | 16.0   | 25.0  | 35.0  |
| <b>Cu</b>                | Copper                         | ppm           | 0.3  | 0.8   | 1.2    | 2.5   | 5.0   |
| <b>B</b>                 | Boron                          | ppm           | 0.3  | 0.5   | 1.2    | 2.0   | 5.0   |
| <b>Ex. Lime</b>          | Excess Lime                    | percent       | 1.0  | 2.0   | 3.0    | 4.0   | 7.0   |
| <b>SS (ECe)</b>          | Soluble Salts                  | mmhos/cm      | 0.3  | 0.7   | 2.0    | 4.0   | 6.0   |
| <b>Cl</b>                | Chloride                       | ppm           | 70.0 | 170.0 | 350.0  | 900.0 | 999.9 |
| <b>Mo</b>                | Molybdenum                     | ppm           | 0.05 | 0.1   | 0.2    | 0.4   | 1.0   |

**Example:** Organic matter = “Medium” between 2.3% and 3.7% (inclusive of numbers)

### A & L Western Agricultural Laboratories, Inc.

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The Soil Experts.

## SOIL SALINITY PACKAGE RECOMMENDATIONS

Soils are generally categorized as follows:

| Soil         | Soil pH | Electrical Conductivity | Sodium Adsorption Ratio |
|--------------|---------|-------------------------|-------------------------|
| Saline       | <8.5    | >4.0 dS/m               | <13-15                  |
| Saline-Sodic | <8.5    | >4.0 dS/m               | >13-15                  |
| Sodic        | >8.5    | <4.0 dS/m               | >13-15                  |

If the sodium adsorption ratio (SAR) at the soil surface is greater than five times the electrical conductivity of the irrigation water ( $EC_w$ ) then gypsum should be applied to the **surface** (after tillage, preferably) to facilitate water penetration.

If the sodium adsorption ratio (SAR) at about six inches below the surface is greater than ten times the electrical conductivity of the soil extract ( $EC_e$ ), then gypsum or gypsum-forming products should be **incorporated**, to facilitate rapid sodium replacement.

SAR and  $EC_e$  should increase with depth if leaching irrigation is adequate, and water quality is satisfactory.

### Leaching Requirements:

It soon becomes apparent, the importance of knowing one's irrigation water quality in order to determine leaching requirements for crops.  $LR = EC_w/5(EC_e) - EC_w$  where  $EC_e$  corresponds to that at an acceptable yield potential.  $EC_w$  = irrigation water. A multiplication factor,  $EC_e/EC_w$  may also be used to read off a graph. Refer to the *Western Fertilizer Handbook* for detailed information.

**Warning: Excessive leaching may raise the water table and exacerbate the situation! Minimize leaching and choose salt-tolerant crops wherever possible.**

### Gypsum Requirements:

We need to express Saturation Percentage in terms of Cation Exchange Capacity, in order to determine how many meq Na/100g soil we need to replace.

| Sat. %    | C.E.C.        | Texture        | Available Water Held       |
|-----------|---------------|----------------|----------------------------|
| 20 - 35%  | 7-15 meq/100g | Sandy loam     | 0.6 – 1.0 inches/ft depth. |
| 35 - 50%  | 15-30         | Loam-silt loam | 1.0 – 1.5                  |
| 50 - 65%  | 30-40         | Clay loam      | 1.5 – 2.0                  |
| 65 - 135% | >40           | Clay           | > 2.0                      |

Assume we wish to drop ESP from 15.0 to 5.0. We need to replace ...  $(15 - 5) = 10\%$  of say, a CEC of 40 meq/100g soil... = 4 meq sodium/100 g soil.

A general guideline is to apply 1 ton gypsum (86% purity) per 1 meq sodium/100 g soil per acre-six inch depth.

### Boron:

Refer to the *Western Fertilizer Handbook* for crop tolerances to boron.

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